

Claims

1. A cathode material for a secondary battery containing a cathode active material represented by a general formula Li_nFePO_4 (wherein n represents a number from 0 to 1) as a primary component, one or more metal elements selected from the group consisting of metal elements belonging to Group 4, 5, 6, 11, 12, 13 and 14 of the Periodic Table, and a halogen element in an amount of 0.1 mol% or more based on P.
2. The cathode material for a secondary battery according to claim 1, wherein the metal elements are one or more metal elements selected from the group consisting of vanadium (V), chromium (Cr), copper (Cu), zinc (Zn), indium (In), tin (Sn), molybdenum (Mo), and titanium (Ti).
3. The cathode material for a secondary battery according to claim 1 or 2, wherein the total content of the metal elements is in the range of 0.1 to 5 mol%, in terms of element ratio, based on iron in the cathode active material.
4. A cathode material for a secondary battery synthesized so as to contain a cathode active material represented by a general formula Li_nFePO_4 (wherein n represents a number from 0 to 1) as a primary component and one or more metal elements selected from the group consisting of metal elements belonging to Group 4, 5, 6, 11, 12, 13 and 14 of the Periodic Table by mixing a halide or halides of the metal element or elements and the ingredients of the cathode active material represented by the general formula Li_nFePO_4 (wherein n represents a number from 0 to 1) and calcining the mixture.
5. The cathode material for a secondary battery according to any one of claims 1 to 4, further comprising conductive carbon deposited on the surface thereof.
6. A method for producing a cathode material for a secondary battery comprising the steps of: mixing ingredients of a cathode active material Li_nFePO_4 (wherein n represents a number from 0 to 1), and a halide or halides of one or more metal elements selected from the group consisting of metal elements belonging to Groups 4, 5, 6, 11, 12, 13 and 14 of the Periodic Table to

obtain a calcination precursor, and calcining the calcination precursor to composite the cathode active material with the metal element or elements.

7. The method for producing a cathode material for a secondary battery according to claim 6, wherein the calcination step has a first stage in a temperature range of room temperature to 300-450°C and a second stage in a temperature range of room temperature to the calcination completion temperature, and wherein the second stage of the calcination step is carried out after addition of a substance from which conductive carbon is formed by pyrolysis to the product of the first stage of the calcination step.

8. The method for producing a cathode material for a secondary battery according to claim 7, wherein the second stage of the calcination step is carried out at a temperature in the range of 750 to 800°C in an atmosphere of an inert gas.

9. The method for producing a cathode material for a secondary battery according to claim 7 or 8, wherein the substance from which conductive carbon is formed by pyrolysis is a bitumen or a saccharide.

10. A secondary battery containing the cathode material according to any one of claims 1 to 5 as a constituent element.

11. A secondary battery containing a cathode material produced by the method according to any one of claims 6 to 9 as a constituent element.